

REMARKS

The amendment to the claims

Claims 97, 157, 158, 166, 167 and 168 are amended herein to recite that chips on the array are separated by a physical barrier or a hydrophobic surface, that the physical barrier is a groove, and that the hydrophobic surface is a strip, respectively.

Support for the amendments is found in the specification at, for example, page 19 in the description of Figure 2A, stating that sequencing chips, representing an array of identical sections, "can be separated by physical barriers or by hydrophobic strips."

At page 40, lines 21-25, the specification teaches that arrays can be separated by hydrophobic surfaces, and that in one aspect, hydrophobic strip technology is utilized.

At page 42, lines 7 through 19, the specification teaches that chips described by Pease, et al., in the art can be separated by grooves.

Claims 97 and 166 are also amended to correct a typographical error. The term "oligonucleotide" in the last line has inadvertently been introduced into the claim and should read "oligonucleotides."

The rejection under 35 USC §102(b)

The rejection of claims 97, 159-160, 163-166, 169-170 and 173-175 under 35 USC §102(b) for being directed to subject matter assertedly anticipated by the disclosure of Southern, Genomics (1992) 13:1008 [hereinafter "Southern"] was maintained. In the rejection, the examiner again relies basically on Figure 3 in Southern to support the rejection.

In response to the applicant's previous argument, the examiner asserted that

[t]he instant claims merely require that the arrays are physically separated. The four-quadrant arrangement is encompassed by the physical separation because a quadrant defines a physical location on a surface. Assignment of an array to a quadrant defines a boundary between quadrants, the boundary being the point of physical separation. In other words, if the arrays are not physically separated, they cannot be in different quadrants.

The amendment to claim 97 herein requires that individual microchips are separated by a physical barrier or a hydrophobic surface, and inasmuch as claim 157 reciting

physical barriers prior to amendment was not rejected, the applicant submits that the amendment obviates the 102(b) rejection.

The rejection under 35 USC §102(e)

The rejection of claims 97, 157-160, 163-170 and 173-175 under 35 USC §102(e) for being directed to subject matter assertedly anticipated by the disclosure of Winkler, US Patent No. 5677195 [hereinafter "Winkler"] was also maintained. In response to the applicant's previous arguments, the examiner asserted that

the features upon which the applicant relies (i.e., 4096 oligos having distinct sequences are arrayed on a chip, 4096 chips are produced and then arrayed) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. [Citation omitted.] It is noted that the instant claims do not require that the oligonucleotide probes differ and do not require any specific number of probes. The claims merely require 'an array of oligonucleotide probes.' Furthermore, it is noted that the passage cited from the specification is 'one exemplary embodiment' and therefore does not define and/or limit the invention.

The applicant refers the examiner to the specific language of claim 97 which recites "microchips having oligonucleotides with different sequences attached thereto." Thus, the examiner is incorrect in asserting that the claims do not require that the oligonucleotide on the chips differ. Moreover, regardless of the actual number of oligonucleotides on the microchip, the limitation that multiple oligonucleotides with different sequences are present on each microchip which are arrayed on a support is distinct from the disclosure of Winkler.

Winkler does not disclose an array of microchips, i.e., an array of arrays. Instead, the disclosure describes "formation of arrays of large numbers of different polymer sequences" and these polymers are attached to the same solid support. This Winkler product is distinct from the instantly claimed invention, as evidenced by the description of microchips in Example III beginning at page 40.

Specifically, Example III describes embodiments wherein 3 mm x 3 mm chips, each chip having 6mer oligonucleotides attached thereto, are arrayed on a 20 cm x 20 cm surface. In another example, 9mer oligonucleotides are attached to 5 mm x 5 mm chips

and 4000 units of such chips are used to prepare a 30 cm x 30 cm array. In still other examples, the Example III refers to Figures 2A, 2B and 2C depicting square arrays of 4000 to 16000 oligochips. For each of these arrangements, individual chips are first prepared which are then be arrayed on a support in any desired format.

In contrast, the Winkler product consists of a support on which polymers are either directly synthesized or directly attached. At best, the Winkler product is arguably analogous to a single microchip in the instantly claimed invention, but still differs from the instant microchips in that Winkler designs the product to have a substantially pure polymer at each discrete location on the support. As Winkler states beginning at col. 7, line 25, it is this substantial purity within a predefined region that distinguishes that region from other predefined regions on the substrate. In both Winkler and the instant invention, a single unit array (i.e., a single microchip in the instant invention) of oligonucleotide spots can be seen as an "array of random molecule arrays" but a unit array is completely different from an array of two or more arrays of oligonucleotide spots, i.e. from an array of two or more "arrays of random molecule arrays." Thus Winkler does not disclose an array of oligonucleotide spot arrays wherein the oligonucleotide spot arrays within composite array (i.e., the array or arrays, or arrayed microchips) are separated by physical barriers or hydrophobic spaces.

Accordingly, Winkler fails to disclose each and every limitation of the invention as claimed and the disclosure cannot anticipate the subject matter of the instant claims. Therefore, the rejection must be withdrawn.

The rejections under 35 USC §103

The examiner also maintained rejection claims 162 and 172 under 35 USC §103 for being directed to subject matter allegedly rendered obvious by the disclosure of Winkler in view of the disclosure of Augenlicht, US Patent No. 4981783 [hereinafter "Augenlicht"].

For reasons discussed above, the disclosure of the primary reference Winkler cannot anticipate the subject matter of the broad claims because it fails to disclose each and every limitation of these claims. Because the limitations of the broad claims attach to the subject matter of the dependent claims, Winkler cannot disclosure all limitations of these

claims either. Adding in the disclosure of Augenlicht fails to correct this deficiency in the Winkler disclosure because Augenlicht does not disclose arrays of physically separate microchips or arrays wherein the microchip on the array have oligonucleotides with different sequences attached.

Because the combined disclosures fail to teach each and every limitation of the invention, the combination cannot render obvious the claimed subject matter and the rejection over the disclosures of Winkler and Augenlicht may properly be withdrawn.

The double patenting rejection

The applicants acknowledge that in the Advisory Action, the examiner withdrew the obviousness-type double patenting rejection of claims.

CONCLUSION

In view of the amendments and remarks made herein, the applicant submits that all claims are in condition for allowance and requests notification of the same.

Dated: July 2, 2007

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